

Department of Defense Logistics Transformation Strategy



Achieving Knowledge-Enabled Logistics

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FOREWORD

This document presents the Department of Defense (DoD) strategy to reconcile advanced logistics concepts in support of distributed adaptive operations and DoD transformation, as required by the FY06 Strategic Planning Guidance. The strategy was prepared for the Under Secretary of Defense (Acquisition, Technology, and Logistics) by the Logistics Transformation Roadmap Steering Group, under the direction of the Joint Logistics Board. The strategy includes a comprehensive process to reconcile Focused Logistics, Force-centric Logistics Enterprise, and Sense and Respond Logistics. The strategy also encompasses other transformational operations, intelligence, and logistics concepts to provide a more comprehensive approach to achieve Joint Focused Logistics capabilities. An aggressive experimentation campaign and rapidly developed operational prototypes are included to test, refine, validate, integrate, and socialize transformational logistics technology and concepts. These efforts will enable DoD to better manage logistics developments and to integrate and coordinate with developing concepts for military operations. This strategy supports the detailed Focused Logistics Roadmap to be published in 2005, which will include specific programs, milestones, and resources to achieve Focused Logistics capabilities.

1. Background

Focused Logistics is the Department of Defense (DoD) approved Joint Logistics Functional Concept to achieve logistics capabilities in support of distributed adaptive operations. As such, Focused Logistics (FL) is the strategic concept that defines broad joint logistics capabilities that are necessary to deploy, employ, sustain, and re-deploy forces across the full spectrum of operations. This strategic framework is intended to be updated and refined as DoD further develops Joint Operating Concepts and Joint Integrating Concepts, and as advanced and transformational concepts for military operations and related logistics support are refined, tested, and matured.

Since the Joint Requirements Oversight Council (JROC) approval of the Focused Logistics Joint Functional Concept in December 2003, the DoD has continued to evolve and mature several operational and logistics concepts associated with network-centric warfare, expeditionary operations and sea-basing, and distributed adaptive operations. Distributed adaptive operations assumes that each element (or unit of action) can autonomously perform particular tasks, using one or more methods and each element may carry out an entire task itself, or it may coordinate with other elements that perform parts of the task. Incorporation of network-centric operations and warfare concepts and technologies are critical to ensure each element's global awareness of the strategic, operational, and tactical environment to permit informed, coordinated operations focused on meeting commander's intent. Elements are empowered, using globally-established rules, to seize the initiative, to exploit success, to redesign (task organize) themselves in response to threats and opportunities, all guided by achievement of commander's intent. Organizations, composed of these elements, will learn and adapt to successes, failures, and other situational changes. Future joint forces will act in this distributed adaptive manner to generate desired effects in support of the commander's intent.

These characteristics of distributed operations dictate a far more integrated vision of logistics transformation than previously addressed. This vision builds upon DoD successes and lessons learned in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), the U.S. initial applications of distributed operations in the 21st Century. In addition, a set of overarching transformational military concepts, specifically network-centric operations and warfare are emerging that require close integration of operations, intelligence, and logistics functions. Finally, the commercial sector has advanced modern supply chain management disciplines and methodologies, built upon advanced information technology to achieve distributed, adaptive logistics support. The end state vision of this effort is integrated joint logistics that fuses information, logistics processes, and platform embedded sensor-based technologies to support tactical, operational and strategic sustainment levels operating in a joint integrated logistics environment.

The emergence and maturation of advanced concepts and technology developments led the Secretary of Defense, through the FY06 Strategic Planning Guidance (SPG), to direct the Under Secretary of Defense (Acquisition, Technology, and Logistics) to reconcile Focused Logistics, emerging advanced concepts, and recent lessons learned into a coherent logistics transformation strategy that supports distributed, adaptive operations, and to initiate a joint effort to integrate logistics from point-of-effect to source of supply/services, across Services and

Defense Agencies. In addition, the next iteration of Joint and Service Transformation Roadmaps will include plans to evolve to this integrated logistics transformation strategy and address concept, process, metrics and experimentation.

To accomplish that direction, USD (AT&L) tasked the Deputy Under Secretary of Defense (Logistics and Materiel Readiness) to form a General Officer level Logistics Transformation Roadmap Steering Group (LTRSG) under the direction of the Joint Logistics Board (JLB). The LTRSG recognized Focused Logistics as the governing, JROC-approved joint logistics functional concept and began an assessment of other operations and logistics concepts and potential capabilities within the context of Focused Logistics capabilities and attributes, as defined by the Focused Logistics Functional Capabilities Board (FL FCB). In addition, recent logistics lessons learned from OEF and OIF were incorporated. The result of that assessment was coordinated through the FL FCB [in the Joint Requirements Oversight Council (JROC)/Joint Capabilities Integration and Development System (JCIDS) process] and the JLB. The LTRSG and the JLB also recognized that several aspects of logistics transformation required experimentation and prototyping. Thus, a major component of the logistics transformation process is the use of experimentation and rapidly developed operational prototypes to support and enrich reconciliation of advanced concepts and technologies, and to test the operational, organizational, and technological validity, impact, and military utility of transformational elements, especially in a larger context across the range of military operations.

This paper documents the logistics transformation strategy that is required by the SPG. The paper includes a brief description of key concepts, near-term refinements of the Focused Logistics Joint Functional Concept to better support distributive, adaptive operations, and specific actions and milestones to more fully assess required capabilities. This strategy will be summarized in the more detailed Focused Logistics Roadmap to be published in February 2005, which will include specific programs, milestones, and resources to achieve Focused Logistics capabilities.

2. Key Logistics Concepts

DoD logistics is a \$90B per year activity, involving over a million people, with global presence and responsibility. As such, DoD continuously assesses best practices and evaluates new concepts, similar to large leading-edge commercial entities. For the purposes of this paper and in accordance with the SPG-directed reconciliation effort, the DoD concentrated on key documented and emerging logistics concepts. These concepts include:

- Focused Logistics (FL)
- Force-Centric Logistics Enterprise (FLE)
- Sense and Respond Logistics (S&RL)

In addition, the DoD reviewed the emerging Joint Force Projection and Sustainment (JFP&S) concept, which USJFCOM has proposed for development as a Joint Operating Concept.

Other logistics and operational transformation concepts will be incorporated into future FL capabilities as they mature.

2.1 Focused Logistics

Focused Logistics is the ability to provide the joint force the right personnel, equipment, supplies, and support in the right place, at the right time, and in the right quantities, across the full range of military operations. This will be made possible through a real-time, net-enabled information system providing accurate, actionable visibility as part of an integrated operational picture, effectively linking the operator and logistician across joint forces, Services, and support agencies, the commercial sector, and coalition partners. Through transformational innovations to processes, systems, and organizations, Focused Logistics will provide the joint warfighter with support for all functions.

The Focused Logistics Joint Functional Concept (FL JFC) defines capabilities and attributes that are required to effectively project and sustain U.S. forces. The FL JFC identifies these seven key joint logistics capability areas:

- Joint Deployment/Rapid Distribution
- Agile Sustainment
- Operational Engineering
- Multinational Logistics
- Force Health Protection
- Information Fusion
- Joint Theater Logistics Management.

The FL JFC also identifies these nine key joint logistics attributes:

- Fully Integrated
 - Expeditionary
 - Networked
 - Decentralized
 - Adaptable–
 - Decision Superiority
 - Effective
 - Reliable
 - Affordable.
-
- The most current definitions and descriptions for these capabilities and attributes are at Appendix 1. The FL concept also encompasses several Joint Theater Logistics (JTL) initiatives and emerging concepts:
 - Joint Logistics Joint Integrating Concept (JIC)
 - Joint Deployment and Distribution Operation Center (JDDOC)
 - Lessons Learned DOTMLPF Change Requirement (DCR)

These initiatives will be matured through the JCIDS process as near-term priorities within the DoD.

As a JROC-approved joint functional concept, Focused Logistics provides both the strategic framework and the disciplined joint capabilities process to enable a coherent logistics transformation strategy.

2.2 Force-centric Logistics Enterprise (FLE)

The Force-centric Logistics Enterprise (FLE) is DoD's mid-term vision (2005-2010) to accelerate logistics improvement, enhance support to the warfighter, and align logistics processes with the operational demands of the 21st Century. FLE encompasses six initiatives:

- **Depot maintenance partnership.** This initiative is designed to increase the use of public-and-private partnerships in the operation of DOD's depots. While DOD will continue to have a depot maintenance capability, the partnership initiative should increase private-sector investment in depot infrastructure, foster better, more efficient management of depot workers and facilities, and improve depot business practices.

- **Condition-based maintenance plus (CBM+).** The CBM+ initiative covers a variety of technological and business changes designed to create a new maintenance environment in DOD. Projected changes focus on the vehicle platform with automated embedded sensor-based technologies providing standardized data in an integrated data environment. These initiatives include enhanced prognostics and diagnostic techniques, failure and trend analysis, electronic portable or point of maintenance aids, serial item management, Automated Identification Technology, and data-driven interactive training.

- **Total life cycle systems management (TLCSM).** This initiative primarily targets DOD program managers. It seeks to establish the accountability of program managers to acquire systems in a timely fashion, meet warfighter requirements for system performance throughout a system's life cycle, and integrate sustainability, maintainability and disposal/demilitarization considerations into the acquisition process.

- **End-to-end distribution.** The goal of this initiative is to improve the flow of materiel to the user and synchronize deployment and sustainment efforts. It will produce an integrated, streamlined system of distribution that will provide warfighters with the materiel, and the information about that materiel, that they need. End-to-end distribution will be achieved by instituting new or improved mechanisms that span function and organization boundaries.

- **Executive Agents (EA).** This initiative will create a formal process for aligning the designation of executive agents with warfighter requirements identified from the National Defense Strategy. It will produce executive agent assignments that will support the warfighter "across the full spectrum of operations, including support on an end-to-end basis and rapid response to all deployments."

- **Enterprise Integration (EI).** As its name indicates, this initiative will bring together information technologies needed to implement new logistics business practices. Building on activities within the military services, Combatant Commands and the Defense Logistics Agency, enterprise integration will use “commercial off-the-shelf tools [to develop] modern, integrated solutions to complex information requirements across the DOD logistics enterprise.” Enterprise integration will provide access to the near-real-time, actionable information from the tactical, operational, and strategic levels that is required for achieving Focused Logistics. This initiative includes the emerging Joint Distribution Architecture (JDA), currently under development by TRANSCOM as the Distribution Process Owner. The relationships between the Business Enterprise Architecture (BEA), Enterprise Integrated Data Environment (EIDE), and the role of the Distribution Portfolio Manager will be further refined through the architecture/portfolio management process. These initiatives will reflect ongoing efforts to incorporate financial control mechanisms for a single logistics billing process.

DoD constructed FLE initiatives by leveraging commercial sector successes, to accelerate achievement of key Focused Logistics capabilities, such as agile sustainment and information fusion. Specific reconciliation of FLE initiatives is presented in Section 3.1.

2.3 Sense and Respond Logistics (S&RL)

Sense and Respond Logistics (S&RL) is an Office of Force Transformation (OFT) initiative based on leading edge operational, organizational, academic and commercial logistics enterprise developments. S&RL is an approach intended to yield adaptive, responsive demand and support for force capability sustainment that operates in situation-conditioned structures that recognize operational context, coherence, and coordination.

Sense and Respond Logistics (S&RL) is a network-centric, knowledge-driven, knowledge-guided concept intended to sustain modular, reconfigurable force capabilities to execute Joint and Coalition effects-based operations and to provide precise, adaptable, agile support for achievement of commander's intent. S&RL relies upon highly adaptive, self-synchronizing, and dynamic physical and functional processes, employing and enhancing operational cognitive knowledge development, sense-making, and decision support. It senses, predicts, anticipates and coordinates actions that provide competitive advantage spanning the full range of military operations across strategic, operational and tactical levels. S&RL promotes doctrinal and organizational transformation, together with technological advancements, and supports scalable coherence of command and control through functional integration of operations, logistics, intelligence, surveillance, and reconnaissance. The S&RL concept is being developed and tested, through experimentation, to provide an end-to-end, point-of-effect to source-of-support adaptive mosaic of logistics resources and capabilities. Within the S&RL vision, every entity (military, government or commercial) is both a potential consumer and a potential provider of logistics. The S&RL vision is intended to deliver flexibility, robustness, and scalability across the full range of military operations through adaptive, responsive, real-time demand and support logistics within U.S., allied, and coalition operations. S&RL capability categories are:

- Adaptive S&RL
- Cognitive Decision Support, Sense-making, and Knowledge Management
- Distributed Adaptive Command & Control (C2)
- Kinetic and Potential Force Sustainment
- Operations, Intelligence and Logistics Capabilities Integration
- Source-of-Support to Point-of-Effect
- Risk Mitigation and Robustness
- Logistics Domain Functionality:
 - Contracting and Acquisition
 - RDT&E Support
 - Force Health Services
 - Personnel Services
 - Operational Engineering
 - Facilities Support

S&RL capabilities will be incorporated into the FL Joint Functional Concept as they mature. S&RL capabilities are being investigated through concept, architecture, and technical development; are being tested and validated through ongoing experimentation coordinated with Services and CoCOMs, by OFT and USJFCOM; and are being developed at DARPA. Specific near-term incorporation of S&RL capabilities into FL capabilities is presented in Section 3.2.

2.4 Joint Force Projection and Sustainment (JFP&S)

As the Department of Defense (DOD) Executive Agent for Joint Experimentation, U.S. Joint Forces Command (JFCOM) Joint Concept and Development directorate's campaign plan employs a two-path strategy; first by developing products that consist of prototypes and secondly, products that consist of joint concepts and actionable recommendations.

Within the Prototype Pathway, the Joint Deployment Process Owner (JDPO) is leading a collaborative effort to transform joint deployment processes to improve joint, multinational, and interagency operations. JDPO initiatives include, among others, transformation of the Time-Phased Force and Deployment Data (TPFDD) and Joint Operation Planning and Execution System (JOPES).

USJFCOM has these additional missions: Joint Force Provider, Joint Force Integrator, Joint Force Trainer, Joint Concept Development and Experimentation Center.

USJFCOM is taking a lead role to bridge the gap between operational planning and execution and deployment planning and execution. In April 2003, the Chairman of the Joint Chiefs tasked USJFCOM to, "Develop a future deployment process concept that evaluates the whole process starting from a "blank piece of paper."

Within the Concept Pathway, the Joint Logistics Transformation Center (JLTC) is experimenting with a future concept based upon on joint lessons learned, senior leader guidance, and experimental evidence. This concept, the *Joint Force Projection and Sustainment for Full*

Spectrum Operations (JFP&S) describes a single, coherently joint deployment, employment and sustainment concept that enables seamless projection and indefinite sustainment of a future joint force. The JFP&S concept is an operational level concept that merges planning and execution of deployment, employment and sustainment of military forces within a single construct, as required by the JOpsC.

JFP&S is the strategic, operational and tactical movement and sustainment of forces and[d1] materiel in support of employment, including the following essential elements:

- Integrating force projection and sustainment functions into a coherent operating system;
- Anticipating through war gaming in the planning process and sensing during execution;
- Interpreting feedback from the interaction of activities and the environment, and then responding through networked capabilities;
- Focusing on precision from point-of-effect to the source-of-support;
- Projecting and sustaining the joint force in global context.

These elements should result in the ability to generate increased employment options for the Joint Force Commander additionally, JPF&S satisfies the urgency to face a new way the DoD must plan for the crises and major conflicts of tomorrow. It does this based on the following tenets:

- Must merge force projection and sustainment to support operations.
- Must employ a knowledge-enhanced effects-based approach.
- Must sense and interpret force projection and sustainment requirements.
- Must use collaboration to allow execution of an effects based approach.
- Must balance operational effectiveness and efficiency.
- Must ensure comprehensive force protection.

It is through JFP&S that the force projection and sustainment efforts of the future become more adaptable and flexible. JPF&S has several enabling pillars which include:

- Jx DS: A Joint Deployment and Sustainment Element.
- GFM: Global Force Management to select forces based on capabilities.
- End-to-End Distribution Management: to provide replenishment to the deployed force capabilities.
- Joint Training: to ensure we have properly trained joint officers to carry out joint taskings.
- Focused Logistics: to provide the synergy to the deployment, sustainment and redeployment efforts.

Experimentation includes exploration of other capabilities that support the JFP&S concept. These activities include:

- **Global Force Management.** The processes that enable comprehensive insight into the **global visibility and availability** of conventional US military forces, and provides senior decision-makers a means to access the risk and consequences associated with proposed allocation, apportionment and assignment changes.
- **JxDS Organization.** An organizational entity for deployment and sustainment – command or staff. It “fights” the deployment and sustainment fight at the combatant command level allowing the Joint Force Commander to more effectively work strategic/long range logistics issues within the Joint Operational Area (JOA). Additionally, the organization bridges the seams which will help visibility of force and sustainment movement from CONUS to the JOA. It also carries out other necessary logistics effects in support of the Joint Force Commander’s Campaign Plan.
- **Force Modularization.** Exploration of those aspects of “capabilities-based” force packages within Effects-Based Planning (EBP). Building joint forces in a similar manner. This involves having the Services organized to create a robust pool of interchangeable forces. This allows the total force to conduct a campaign. The need to focus on core competencies, making maximum use of human resources, and ensure military personnel is used to perform tasks that are essential.”
- **Basing Options.** Exploration of how forward-based, forward deployed and rotational forces affect commander options. Basing also includes options for joint sea basing.
- **Collaborative Tools.** These tools enhance simultaneous, ad hoc crisis and deliberate continuous operational action planning (vertically and horizontally) across operational theaters and other domains that provide operational units and defense organizations simultaneous access to real-time operational, tactical and administrative information.
- **Common Relevant Operational Picture.** The argument can be made that the speed at which information is moved and gathered on the battlefield is a big key to success. U.S. Joint Forces Command (USJFCOM) has been experimenting with systems that will allow joint war fighters to interoperate in gathering vital information, getting the message to the fighters in the field and collaborating with joint leaders and strategists around the world, while never leaving their desks. A presentation of timely, fused, accurate, and relevant information that can be tailored to meet the requirements of the joint force commander is essential to stay ahead of the events presented by a quickly changing battlefield.
- **Lessons Learned from OIF/OEF.** Incorporate the use of a portfolio of programs designed to collect, analyze, and distribute relevant lessons learned and key observations from the operational level of war in support of regional combatant commanders to enhance the operational capabilities of joint forces.
- **CENTCOM Deployment and Distribution Operations Center (CDDOC).** CDDOC is improving CENTCOM’s ability to locate and provide data on shipment quantity, composition and delivery times to expedite the distribution of high priority commodities to the Services. CENTCOM will be able to prioritize and plan for the constantly changing requirements of the military forces while improving the speed, cost effectiveness and efficiency of equipment and supplies delivered. Our on-scene efforts to capture the

initiatives of the CDDOC will greatly enhance the overall JPF&S Concept Development Effort.

- **Limited Objective Experiments (with the Services, USTRANSCOM & OFT).** These will be accomplished to test concepts on Sense & Respond Logistics, End-to-End Distribution, Global Force Management and Sustainment.
- **Partnerships with DISA, DARPA, and the Joint Test and Evaluation (JT&E) on Joint Logistics Process Enhancements (JLOG/PE).** These distinct partnerships will blend current deployment planning and logistics processes and technology into the JFP&S development effort. JFCOM will be able to provide a “best of breed” process through this partnership.

3. Concept Reconciliation

This section details the actions by the LTRSG to reconcile logistics concepts, as required by the FY06 SPG. The LTRSG recognized Focused Logistics as the JROC-approved Joint Logistics Functional Concept. To ensure effective integration of logistics concept requirements into the Joint Capabilities Identification System (JCIDS) process, the LTRSG reconciled the other concepts within the Focused Logistics functional capabilities and attributes. This approach enables full assessment of emerging (i.e. deployment and distribution) capabilities within the normal update cycle of the Focused Logistics Concept in the JROC process.

3.1 Focused Logistics/FLE Reconciliation

As discussed in Section Two, the FLE was an integrated set of initiatives directed toward achieving Focused Logistics capabilities in the areas of agile sustainment and information fusion. Table 3-1 presents a crosswalk of Focused Logistics Capabilities and FLE initiatives. FLE initiatives have been fully incorporated into the Focused Logistics Campaign Plan and will be incorporated as management initiatives into the Focused Logistics Joint Functional Concept during the next scheduled update cycle to the JROC in FY06. The current, significant efforts to integrate the deployment and distribution functional processes are incorporated within the Focused Logistics Concept. These include requisite changes in terminology, accountability, and policy between capability providers, the Global Force Provider, the Distribution Process Owner (DPO), and COCOM.

Table 3-1
Focused Logistics/FLE Initiative Reconciliation

FLE Initiative	Focused Logistics Capability
Depot Maintenance Partnership	Agile Sustainment: Robust, Ready Industrial Base
Condition-Based Maintenance+	Agile Sustainment: Remote Monitoring and Diagnostics
Total Life Cycle Systems Management	Agile Sustainment: Designed-in Deployability, Maintainability
End-to-end Distribution	Joint Deployment/Rapid Distribution: Effective and efficient deployment and distribution processes
Executive Agents	Agile Sustainment: Agile, responsive sustaining organizations
Enterprise Integration	Information Fusion

3.2 Focused Logistics/S&RL Reconciliation

Reconciliation of envisioned S&RL capabilities within Focused Logistics was (and will continue to be) assessed by the FL FCB, the LTRSG, the JLB, and the Defense Logistics Board (DLB).

The initial step in this reconciliation was to incorporate near-term aspects of S&RL into the definitions and descriptions of Focused Logistics capabilities and attributes. These updated definitions and descriptions are recorded in FL JFC Version 1.1, which was coordinated with the joint logistics community and approved by the FL FCB. Enclosure 1 reflects FL JFC Version 1.1.

Key S&RL elements associated with network-centric operations and rules-based sourcing will be evaluated for incorporation into FL JFC Version 2.0 during the next scheduled update cycle to the JROC in FY06. Several aspects of the S&RL vision, objectives, concepts, and architecture will be further explored through near-term experimentation and exercises over the next 18 months. Technical investigation will be accomplished in parallel by OSD OFT through concept development and integration with transformational operations concepts, and through experimentation to test, validate, refine, and socialize the operational, organizational, and technological innovations proposed by S&RL in general and network-centric operations and warfare (NCOW) and distributed adaptive operations specifically. The Defense Advanced Research Project Agency (DARPA) and USJFCOM are also investigating technical and operational concepts relative to S&RL.

Several key assumptions associated with S&RL involve risk in terms of technical maturity, coordination, and management acceptance, and thus warrant further investigation. through prototyping and management assessment. These include:

- Agents will represent commander's intent (plans, orders, tasks, missions, effects), commodity and resource controllers, logistics resources, force capabilities, and other operations elements.

- The knowledge development, sense-making, and cognitive decision support algorithms necessary to calculate operational worth and value, to sense, identify, predict and anticipate opposing force operations and the strategic, operational, and tactical situation, and to generate and evaluate courses of action, will exist.
- An autonomous force tracking capability (such as Blue Force Tracker) exists for all operational, logistics, intelligence elements, and for logistics resources (e.g., through the use of tagging methods such as RFID).
- Force capabilities management with logistics fully integrated with operations and intelligence. As presented, S&RL assumptions cross all functional domains, and many of the S&RL attributes and capabilities are oriented on networks and Command and Control (C2), as well as Logistics.

Self-synchronizing, adaptive operational, organizational, and physical networks are in use in the commercial sector, and are the focus of considerable effort through development and experimentation by OSD OFT and JFCOM in concert with Services and CoCOMs, including large-scale joint expeditionary operations exercises. Additional S&RL experimentation by OSD OFT and JFCOM will include testing, validating, integrating, and socializing NCOW, DAO, and S&RL concepts in an environment that supports two-way learning. Integrating these concepts with other DoD transformational concepts and capabilities at an early, exploratory stage will provide for co-evolution of all the concepts and technologies, and will permit analyses of the operational, organizational, and technological issues associated with advanced military operations concepts. Specific issues being pursued in experiments and exercises, or that will be explored in near-term experiments, include:

- Integration of logistics with operations and intelligence functions to provide Combatant Commanders and Joint Force Commanders with operational leverage. This includes:
 - Preparation of plans, development of capabilities, and preparation of the force for sustainable expeditionary operations;
 - Development of a categorization and terminology to represent modules of force capabilities applicable in varying situations and environments, and rules for their configuration to execute commander's intent based on potentially specified effects;
 - Development of a consistent terminology for expressing and using command direction and commander's intent, especially relative to Effects-based Operations;
 - Determining the impact of logistics sustainment upon military operations risk and on the achievement of commander's intent;
 - Development of a consistent knowledge base that integrates and correlates common knowledge necessary for global awareness and local control of logistics operations
- Joint expeditionary operations, and the full cycle of preparation, deployment, employment, sustainment, and redeployment, using adaptive operations;
- Strategies for the development and adaptation of business rules to accommodate evolving commander's intent, situation, environment, and force capabilities status

- Organizational structures, doctrine, and TTPs for both logistics and operations forces that permit situational and environmental adaptation;
- NCOW and DAO concepts, capabilities, and impacts on operations and organizations, as a basis for S&RL;
- Technical additions to the National Information Infrastructure, and to Global Information Grid (GIG), GIG Enterprise Services (ES), and Network-Centric Enterprise Services (NCES), to incorporate the agents, knowledge bases, and sense-making and decision-making cognitive support envisioned by the S&RL concept.

DARPA recently sponsored several studies on technologies for network-centric approaches to logistics, encompassing S&RL and related approaches to large-scale adaptive logistics fulfillment networks. These studies demonstrated that network-centric logistics (NCL) networks can have significant quantifiable advantages when compared with the current systems. NCL supply networks promise greater tactical logistics agility, superior survivability, more comprehensive support for the full range of operational forms, and a potential for reduced in-theater logistics footprint. With support from AT&L, DARPA is evaluating the feasibility of a full-scale multiyear Network Centric Logistics research program that would create and mature the new information technologies necessary to implement S&RL and related networked approaches to logistics in the joint force.

In addition to technical experimentation, the S&RL concept involves several management areas that warrant deliberation by senior DoD logistics leaders. The S&RL vision extends beyond the use of networks and relational databases to a logistical capability that is focused on operational needs and Commander's intent. Ongoing S&RL experimentation will enable greater evolution of the collective knowledge base and enlighten key management decisions. Near-term areas for consideration include:

- Full integration of intelligence, operations, logistics, and a network-centric distributed adaptive operations environment
- Network hosted business rules for logistics operations, support for achievement of commander's intent, evaluation and prioritization of situational, environmental, and force status context, and for sourcing and lateral redistribution
 - Including allied material, host nation, and opportunistic supplies and services
- Industrial base responsiveness to demand signals
 - Using pre-arranged contracts and pre-positioned resources
 - With a "build-to-order" industry
- DoD capability to process demand signals (that are not requisitions)
 - Use of signals to identify force and supply locations
 - Sensor suites and backfitting to fielded systems
 - Routing and response messaging
- Implementing Combatant Commanders directive authority for logistics
- Broader global sourcing of material and services
- Reduced theater logistics, relying on reach back and continuous resupply capability (reach back problems are being addressed relative to OEF and OIF by the Joint Deployment Process Owner, the Distribution Process Owner (DPO), and TRANSCOM's deployment and distribution operations center)

- DoD capability to document, translate, and manage commander's intent and situational awareness into appropriate logistics actions in a process supported by knowledge development, sense-making, and cognitive decision support
- Dramatic increases in logistics process integration
 - This requires increased systems integration, as dictated by the Department's stated objectives to employ NCOW as an integrating mechanism

These areas will be evaluated and assessed by the JLB over the next 18 months. Appropriate adjustments to the Focused Logistics Joint Functional Concept will be submitted for JROC approval following JLB deliberation. To facilitate this ongoing process of reconciling/updating FL capabilities, technical representatives of emerging concepts will exchange research, development and experimentation results on a periodic basis.

3.3 Focused Logistics and JFP&S

Insights from recent experiments and lessons learned reveal that the Joint Force Commander must envision, and then execute a coherent operation, ever blending force projection with employment and sustainment, simultaneously and in sequence, to achieve the strategic aims he has been given. The JFP&S concept is being developed to address the void in current joint concepts.

Definition of the JFP&S Concept. The JFP&S concept describes the alignment of force projection and sustainment operations so that the joint force commander can employ as envisioned. This concept describes JFP&S through the continuous projection and sustainment of the joint force through any operation or combination of operations, including peacetime and routine operations. *Specifically, JFP&S is the operational binding of strategic and tactical movement and sustainment of forces and materiel in support of employment.*

JFP&S is "more than logistics". As described in the Joint Operations Concepts (JOpsC) employment constructs envisioned in 2015 and beyond are more simultaneous, decentralized, distributed operations. However, our current force projection and sustainment operations are overly linear, centralized, and generally executed sequentially. They are often characterized as being slow, rigid and cumbersome. Focused on distributing commodities vice providing capabilities, our logistics tail is often too large, too long and too slow. Stovepipes, gaps and seams between and among Services, multi-agency and multinational partners have yielded myriad incompatible force projection and sustainment systems and hurdles to sharing information and support with one another.

Supporting the Joint Force Commander. Resolving this mismatch requires an understanding of the relationship among employment, force projection and sustainment. At the operational level, force projection, sustainment, and employment merge. A joint force commander must envision, and then execute a coherent operation, ever blending force.

USJFCOM summarizes the linkage between the JFP&S concept and JROC-approved joint functional concepts in the following table.

JFP&S to JOpsC Capability Mapping

P = Primary Link, S = Secondary Link

Functional Concepts

C2 = Command & Control BA = Battlespace Awareness
FA = Force Application FL = Focused Logistics
PRO = Protection

JFP&S Capability		Common Understanding	Decision Superiority	Adaptive	Rapid Employment	Continuous Pressure	Disrupt the Adversary	Distributed DES	Coordinate with IA & MN
C2	Define Desired Effects	S	P					S	S
	Express Commander's Intent	S	P						
	Coordination of planning among all partners	P		S	S				S
	Planning in a collaborative environment	P		S	S				
	Automated declassification for Information sharing	P	S	S	S				
	Facilitate collaborative decision and action	S	P	S		S		S	S
	Effective leadership		S						S
	Integrate sense and respond methodology		S	P		S		S	
	Expand JFC directive authority for logistics		P	S		S		S	
BA	Expand JFC capability to implement DAFL		P	S		S		S	
	Persistent situational understanding	P	S	S				S	
	Robust ISR systems	P	S	S					
	Comprehensive intelligence analysis	P	S						
FA	Timely, accessible intelligence dissemination	P	S						S
	Rapid mobility of forces			S	P	S	P	S	
FL	Integrated employment of forces			S	S	S		S	S
	Integrate with planning and execution processes	S	S	S	S			P	
	Dynamic Future Capability Assessment	S	S	P	S				
	Modular Joint Force Packaging			S	P	S	S		
	Sustain in an access denial environment			S		S	P		
PRO	Apply sense and respond methodology	S	S	P				P	
	Full dimension protection			S		S	S	S	
	Joint casualties and MEDEVAC system					S		S	

4. Logistics Transformation Process

A transformed logistics capability can provide sustained competitive advantage for the United States and its allies in current and future operations. The Focused Logistics Roadmap will detail specific initiatives; however, any one advanced weapon system, process, logistics service, ERP system, or technology is bound to be countered by an enemy which DoD views as a complex adaptive system. This is especially true today in the age of reduced barriers to entry and increased competition from small non-state enemies with cheap technology. The only sustainable source of competitive advantage in the long run is the creation of a DoD adaptive enterprise capability that includes logistics, but is also much broader.

The logistics transformation strategy follows directly from the strategy for defense transformation and is concept and capabilities driven. Transformation is not some future, hazy end-state on the horizon out in 2015 or 2020. It is a continuous process that must, and does, start now. This chapter describes a dynamic approach for rapidly evolving a set of capabilities, as opposed to perfect planning, development of comprehensive requirements, or engineering. Some initiatives to design and develop those capabilities can begin immediately. The process for rapidly evolving these capabilities is based upon a strategy of transformational co-evolution.

Co-evolution provides DoD with an accelerated path from concept to operational capabilities. It is a process for sustained innovation within DoD whereby rapid progress can be made by taking a holistic approach and rapidly iterating and cross-leveraging concept, process, experimentation, technology, and organizations. This approach can yield high velocity incremental increases in capability, while continuously refining the elements. This approach relies heavily on proof-of-concept and learning prototypes and suggests you don't have to wait for all enablers to be available to make progress. Techniques include the use of social experiments, surrogates, and proxies for future enablers. The prototype is based on an architecture and enterprise framework which is open and extensible to be improved and modified as required.

Much of this strategy is contained in the continuous experimentation campaign which is central to achieving continuous logistics transformation. It consists of:

- Continuous co-evolution of logistics capabilities, employing:
 - proof-of-concept and learning prototypes that are used for experimentation and assessment, and that may lead to implementation end items;
 - rapid evolutionary development of DOTMLPF solution capabilities (in physical, cognitive, and information domains using early developments, e.g. alphas, betas, and pre-production items)
 - surrogates, including modeling and simulation, of the logistics capabilities and of other military enterprise capabilities and infrastructure;
 - early integration of prototypes and rapid development products with other military enterprise capabilities and infrastructure;
- Aggressive scheduling and execution of learning-oriented hypothesis-driven experiments, including tabletops, simulations, limited technical assessments, interactive experiments with warfighters, exercises, wargames, ACTDs, and controlled use of early development capabilities in real world environments. These have, as their objectives:
 - socialization, capabilities exposure
 - knowledge-development and -sharing
 - two-way learning
 - military utility assessment
 - development evolution and refinement
 - review, validation
 - introduction, training
 - accelerated DOTMLPF development and integration;
 - support for budget process, congressional oversight, strategic direction and guidance

A central element of the logistics transformation experimentation campaign is the encouragement and fostering of public/private cooperation, including evaluation and integration into the experimentation campaign (and subsequently into transformed logistics capabilities) of knowledge, technology, science, research, and products from the public/private sector. This also includes sharing of development costs and risks; and testing and evaluation of the integration with commercial, academic, and other government/non-government/private capabilities and

infrastructure, as necessitated by the range of military operations. This process allows for the rapid creation of knowledge and insights and is opportunistic and constantly seeks ideas and enabling technologies from a proactive, networked interaction within and between government, industry, and academia.

It is important to note that while this is a document primarily focused on logistics, it is much larger than that. While it is generally recognized that better interfaces are needed between logistics and other functional domains, this strategy goes further and states that they must be *inextricably linked* and function in a holistic environment which might be termed Distributed Adaptive Operations (DAO).

5. The Way Ahead

The Department of Defense is moving aggressively to transform existing logistics processes, infrastructure, and systems through DOTMLPF changes to create the capability to project and sustain force rapidly with minimal footprint and to support distributed, adaptive operations. This document presents DoD's strategy for reconciling logistics concepts within disciplined processes to mature technologies, and their application in a joint context, along with cultural willingness to accept organizational and doctrinal changes to maximize development of joint capabilities, while considering national security management implications. Specific near-term actions include:

- Document and publish DoD's Focused Logistics Roadmap (FLR) that catalogues programs, milestones, resources, and risks associated with achieving Focused Logistics Capabilities (FEB 05).
- Develop and execute robust near-term series of experimentation spirals to feed early FLR program and policy course corrections (DEC 04 - Oct 05)
- Develop/demonstrate S&RL technologies and their applications associated with distributed adaptive operations and NCOW, leading to recommended DOTMLPF changes (DEC 04 – SEP 07). Document the milestones for this process in the FLR.
- Assess management and risk elements of challenging S&RL elements (DEC 04 – JUN 06). Document the milestones for this process in the FLR.
- Achieve JROC approval of Focused Logistics Joint Functional Concept Version 2.0 (MAR-JUN 06).
- Establish a dedicated office within AT&L to guide the attainment of Focused Logistics Capabilities, promote transformational logistics as a sustained competitive advantage and accelerate co-evolution of new capabilities.
- Modify DoD Policy Directives and Doctrine, as appropriate, to support alignment of redefined emerging roles, responsibilities, and procedures.

APPENDIX 1
FOCUSED LOGISTICS CAPABILITIES AND ATTRIBUTES

Essential Capabilities

The joint logistics community and the joint warfighting science and technology community have identified a number of new or improved capabilities essential for meeting Focused Logistics challenges and enabling distributed and adaptive operations. Below are listed the identified required capabilities.

Joint Deployment/Rapid Distribution

Capabilities essential for meeting the joint deployment/rapid distribution challenge include the following:

- A fully enabled mobility system, with full-spectrum-capable mobility forces in the right numbers and types, trained in joint logistics operations, supported by a robust infrastructure, and further characterized by capabilities for
 - optimizing rapid projection, delivery, and handoff of joint forces and sustainment assets worldwide
 - opening theaters rapidly and distributing required forces and sustainment at the place and time required
 - supporting rapid force maneuver within the joint or combined operations area
 - returning forces to the sea base, home station, or other location for regeneration and reconstitution.
- Effective and efficient deployment and distribution processes
 - enabled by integrated business practices and interoperable systems
 - integrated and synchronized vertically and horizontally from the strategic to the tactical level
 - capable of determining distribution capacity and optimizing distribution capacity allocation, transportation allocation, carrier selection (including sources of opportune lift), scheduling, and rescheduling based on evolving commander's intent.

Agile Sustainment

Capabilities and characteristics essential for meeting the agile sustainment challenge include the following:

- A robust, ready industrial base
- Agile, responsive sustaining organizations
- Flexible, tailored sustainment, which includes both tailored logistics support packages (with supply requirements automatically generated and assessed with rules-based sourcing from the best of all available sources) and tailored deploying logistics organizations (with potential sources of support forces automatically identified, tailored, and jointly agreed-upon)
- Precision tactical resupply, including delivery by airdrop, precision aerial delivery, or airland, as well as by land- or sea-based assets

- Common metrics, standards, and processes that promote simplicity and interoperability across all Services
- Collaboration with the civilian sector to take advantage of advanced business practices, commercial economies, and global nonmilitary networks
- Integrated and synchronized executive agent responsibilities, contractor logistics support and third/host nation support
- Remote monitoring, diagnostic, and prognostic devices and knowledge based-information systems to sense, predict, report, and anticipate failures and consumption—and thus to anticipate demand—associated with current, modernized, and transformed forces and weapons systems (These systems not only enable logistics managers to provide more timely placement of supply and maintenance resources but also reduce the support footprint in the joint or combined operations area.)
- Supported weapons systems with designed-in deployability, reliability, maintainability, availability, sustainability, and interoperability to increase readiness and reduce logistics requirements and costs.

Operational Engineering

Capabilities and characteristics essential for meeting the operational engineering challenge include the following:

- Effective, efficient and responsive engineer forces that are agile, scalable to the mission, and multi-skilled for the full range of joint and combined operations
- Tools for rapid engineer assessments, contingency planning and execution
 - Enabling engineer combat and combat service support forces to be tailored to reduce strategic lift requirements, and minimizing the engineer footprint in the joint or combined operations area
 - Able to rapidly determine expeditionary facility and infrastructure requirements as well as other engineer support needed for all phases of the operation
- More effective use of pre-positioned engineering equipment and materials as well as contract and host-nation engineers to reduce lift requirements and increase capabilities and capacity
- Advanced construction materials and technologies for improving operations in austere locations
- Streamlined process to obtain vendor support for construction materials.

Multinational Logistics

Capabilities and characteristics essential for meeting the multinational logistics challenge include the following:

- Improved multinational data sharing and interoperability
- Optimized logistics operations across and between all echelons, alliances, coalitions, and host nations
- Improved interoperability among agencies, industry, non-governmental organizations, and private volunteer organizations, particularly in foreign disaster relief and stability operations

- Improved contracting for contingency, humanitarian, or peacekeeping operations to provide for facilities, supplies, and services, including maintenance, transportation, quality of life support, and real estate management.

Force Health Protection

Capabilities and characteristics essential for meeting the force health protection challenge include the following:

- Protection from all health threats across the full range of military operations
- Tailored, standardized joint medical systems to provide only essential care in theater and enhanced care during evacuation to definitive care
- Improved health monitoring and surveillance of forces engaged in military operations by using items such as
 - Individual health status monitors
 - Physiological sensor fusion, image analyses, and diagnostic and prognostic algorithms
 - Improved medical situational awareness interfaces
 - Improved patient tracking;
 - Interoperable small, deployable medical diagnostic systems
 - Ability to access and transmit medical data in real time.

Logistics Information Fusion

Capabilities and characteristics essential for meeting the logistics information fusion challenge include the following:

- A robust, end-to-end information grid
 - Assured communications
 - DOD net centric enterprise services, such as:
 - Universal transaction services
 - Distributed environment support
 - High assurance of services
 - Robust, agile, and survivable infrastructure, combined with joint interdependencies, enables infrastructure that can withstand both kinetic and directed information warfare attacks.
- Real-time, end-to-end¹ control of the entire deployment, distribution, and sustainment pipeline—from mobilization, deployment, employment, reconstitution, regeneration, redeployment, and demobilization, and across the entire logistics spectrum, with the following characteristics:
 - Ability to capture timely, accurate, interoperable source data (enabled by data standards)
 - High-quality, authoritative data available for processing and presentation applications
 - Enhanced asset visibility, control, and management decision support tools that turn available data into “actionable” information

¹ End-to-end is from the source of supply/services to the tactical level/point of consumption/point of effect, across Services and Defense agencies.

- Information-rich visualization so commanders and staff can quickly and efficiently assimilate the volumes of data and information pertaining to their respective areas of responsibility
- Robust network architecture capable of providing all who need it rapid access to an integrated operational picture with timely, accurate, and synchronized operational, intelligence, and logistics information
- Automatic planning and replanning to reduce significantly the time necessary for developing and evaluating alternative approaches for logistics support and for creating a feasible plan
- Execution monitoring—through trigger processes or plan sentinels at key nodes or links in the pipeline—for identifying and reacting rapidly to deviations from the selected plan
- Ability to view the requisition process.

Joint Theater Logistics Management

Capabilities and characteristics essential for meeting the joint theater logistics management challenge include:

- Integrated logistics command and control (C2) enabling the ability to prioritize, direct, redirect, synchronize, integrate, and coordinate common-user and cross-Service logistics materiel and functions under the combatant commander's control
- Interoperable systems with visualization and decision support tools that the combatant commander and JTF commander can use for managing logistics assets and processes in the area of operations
- Fully collaborative capability that links logisticians, intelligence analysts, and operators at the supporting and supported combatant commander or JTF level with each other and with their counterparts at the Service component level, and with interagency and coalition partners.

Attributes

To compare alternative approaches and to measure achievement, concepts and capabilities must have characteristics—attributes—that can be tested or measured.

Logistics capabilities must share many of the attributes of the forces they support. The following attributes for logistics capabilities are derived from the JOpsC and focus on logistics support for future joint force operations that are continuous and distributed, across the full range of military operations:

- **Fully Integrated:** Fully integrated elements with all functions and capabilities focused toward a unified purpose
- **Expeditionary:** Rapidly deployable, employable, and sustainable throughout the global battlespace, regardless of anti-access or area-denial environments, independent of existing infrastructure
- **Networked:** Linked and synchronized in time and purpose, capable of capitalizing on information and near simultaneous dissemination to turn information into actions through a common operating picture
- **Decentralized:** Operate with shared knowledge of adversaries, friendly forces, and the environment, as well as a clear understanding of strategic objectives and

commander's intent, enabling subordinate commanders to compress decision cycles, seize the initiative, exploit fleeting opportunities, and self-synchronize as required

- **Adaptable:** Versatile, agile, tailorable, and scalable, able to adapt fundamental capabilities in a multi-use manner; prepared to quickly respond to any contingency with the appropriate force mix
- **Decision Superiority:** Arrive at and implement better-informed decisions faster than an adversary can react, or in a non-combat situation, at a tempo that allows the force to shape the situation or react to changes and accomplish its mission

In addition, logistics capabilities must have certain attributes associated with the support functions to be performed. The following attributes, identified by the joint logistics community, focus on operationally effective yet cost-efficient logistics support:

- **Effective :** Meet warfighter logistics support requirements under specified conditions to specified standards
- **Reliable:** Consistently meet warfighter logistics support requirements to specified standards
- **Affordable:** Provide warfighter with effective and reliable support capability within specified level of resources.

